

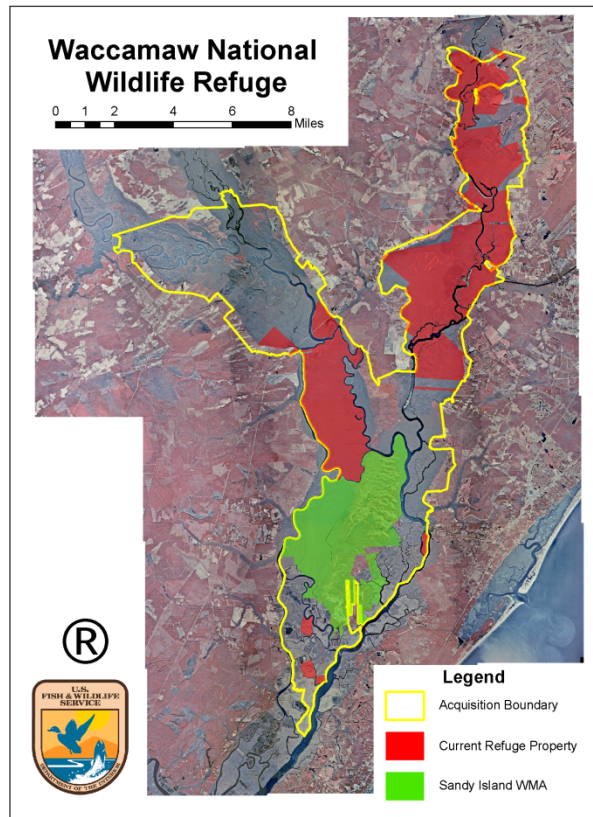
Identifying Coastal Habitats for Conservation Under Sea Level Rise Scenarios

Bethney Ward
Chrissa Stroh
NOAA Coastal Services Center

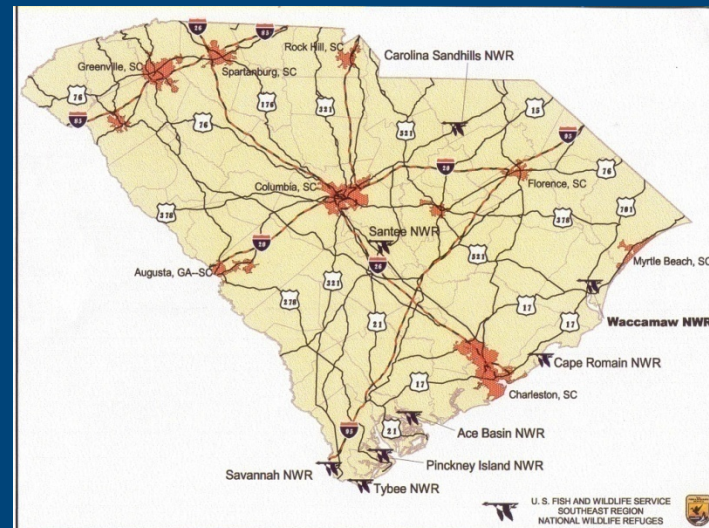


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Waccamaw National Wildlife Refuge



From refuge establishment in 1997 to present, USFWS manages 22,869 acres.

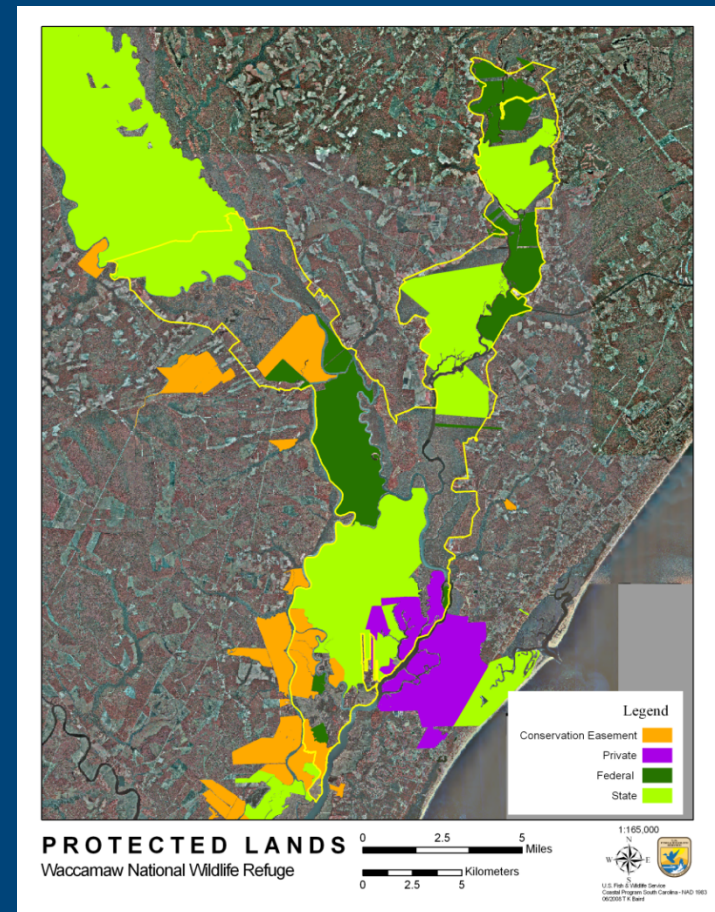


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The “Big Picture” Winyah Bay Focus Area

Waccamaw NWR was proposed by the WBFA Task Force with a specific goal of having a Refuge as a central component of the core conservation area located in the Focus Area.



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Acquisition and Habitat Diversity

- Black Water River Swamp
- Alluvial River Floodplain Forested Wetlands
- Longleaf Pine Ecosystem
- Tidal and Managed Historic Ricefields



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Strategic Habitat Conservation (SHC)

- Swallow-tailed Kites require 100,000 acres of habitat for 80 nesting pairs
- Potential to include Red-cockaded Woodpecker and/or Black Bears
- Long range habitat planning in a rapidly changing environment



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Climate Change Related Threats



- Drought, wildfires
- Unpredictable weather patterns
- Invasive species
- Salt water intrusion, habitat loss



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Potential Habitat Loss



Freshwater Tidal Deciduous / Needle Leaved Forested Wetlands



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Freshwater Tidal Emergent Wetlands



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Deciduous trees are the first to go



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Cypress along river go next



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Transitioning from freshwater forested to brackish emergent marsh



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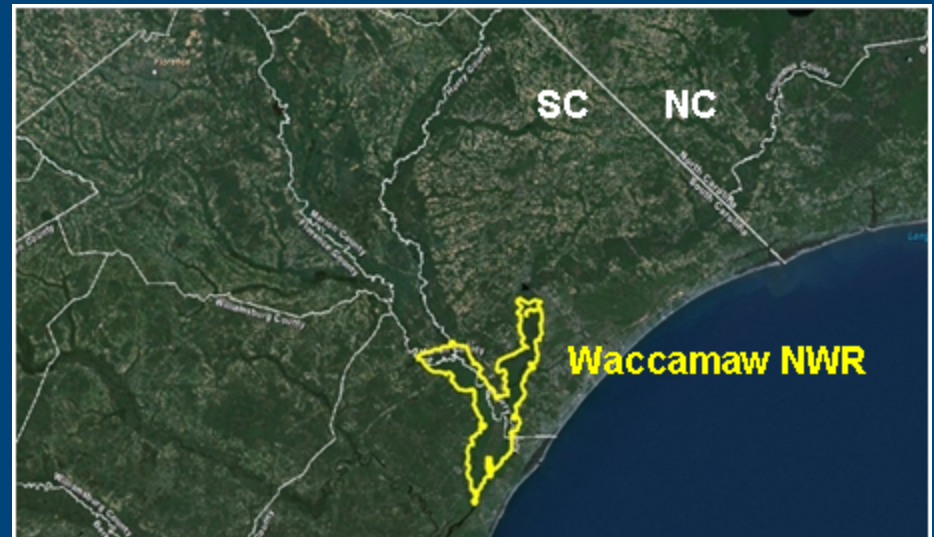
Cypress “bone yard” within a brackish marsh



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A Conservation/Climate Partnership

- Waccamaw National Wildlife Refuge
- NOAA Coastal Services Center
- The Nature Conservancy



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Project Objectives

1. Assess potential sea level rise impacts on coastal habitats
2. Incorporate SLAMM outputs with NOAA's Habitat Priority Planner to identify management strategies



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Sea Level Affecting Marshes Model

Custom inputs

- Adjusted LIDAR DEM
- Habitat classification performed by experts, refined with local knowledge
- Accretion rates from Jim Morris' local studies
- Tidal data from local gauges, adjusted with local knowledge

SLAMM v5.0.1 July 2008

File Management:

Input Data Files (*.dem.txt *.site.txt *.nwi.txt)

Output Directory (must end with a '\')

Data to Save

☒ Save Tabular Data Only
☐ Save Output for GIS

SLR scenarios to Run

Titus and Narayanan, 1995 | IPCC, 2001 or Fixed

Scenarios	Estimates	and/or Fixed Rise by 2100
<input checked="" type="checkbox"/> A1B	<input type="checkbox"/> Min	<input type="checkbox"/> 1 meter
<input type="checkbox"/> A1T	<input type="checkbox"/> Mean	<input type="checkbox"/> 1.5 meters
<input type="checkbox"/> A1F1	<input checked="" type="checkbox"/> Max	<input type="checkbox"/> 2 meters
<input type="checkbox"/> A2		
<input type="checkbox"/> B1		
<input type="checkbox"/> B2		

☒ Save Working Data in RAM
☐ Save Data on Hard-Drive
☐ Use Existing Data File

☐ Additional File Optimization

Protection Scenarios to Run

☐ Don't Protect
☒ Protect Developed
☐ Protect All

☒ Include Dikes

☒ Run Model for NWI Photo Date (T0)
☐ Include Tall Spartina Model

For Sites with Estuaries

☒ Display Maps on screen
☒ Pause with Examination Tools
☐ Automatically Paste Maps to Word

☐ No Maps (Quicker Execution)

Initial Zoom: 100%

Time Step (years): 25
Last Year of Simulation: 2100



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Habitat Priority Planner (HPP)

Decision support tool guiding management action for

- Conservation, restoration, land use planning

Designed for interactive use with stakeholders

Requirements:

- ArcGIS 9.2 or 9.3 with Spatial Analyst
- Raster or vector landcover layer
- Site-specific vector data (optional)



www.csc.noaa.gov/hpp



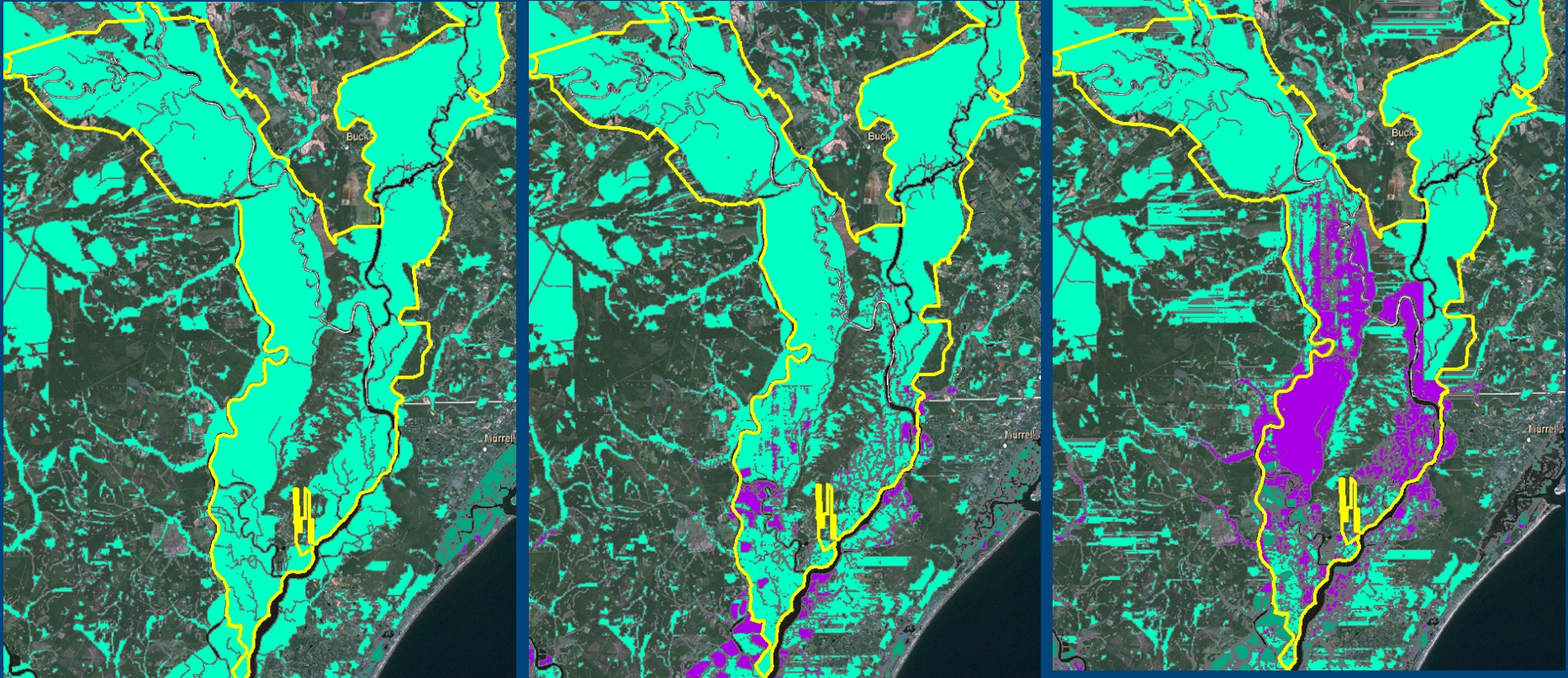
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SLAMM Results for Waccamaw NWR

NWI - 1994

2025

20250



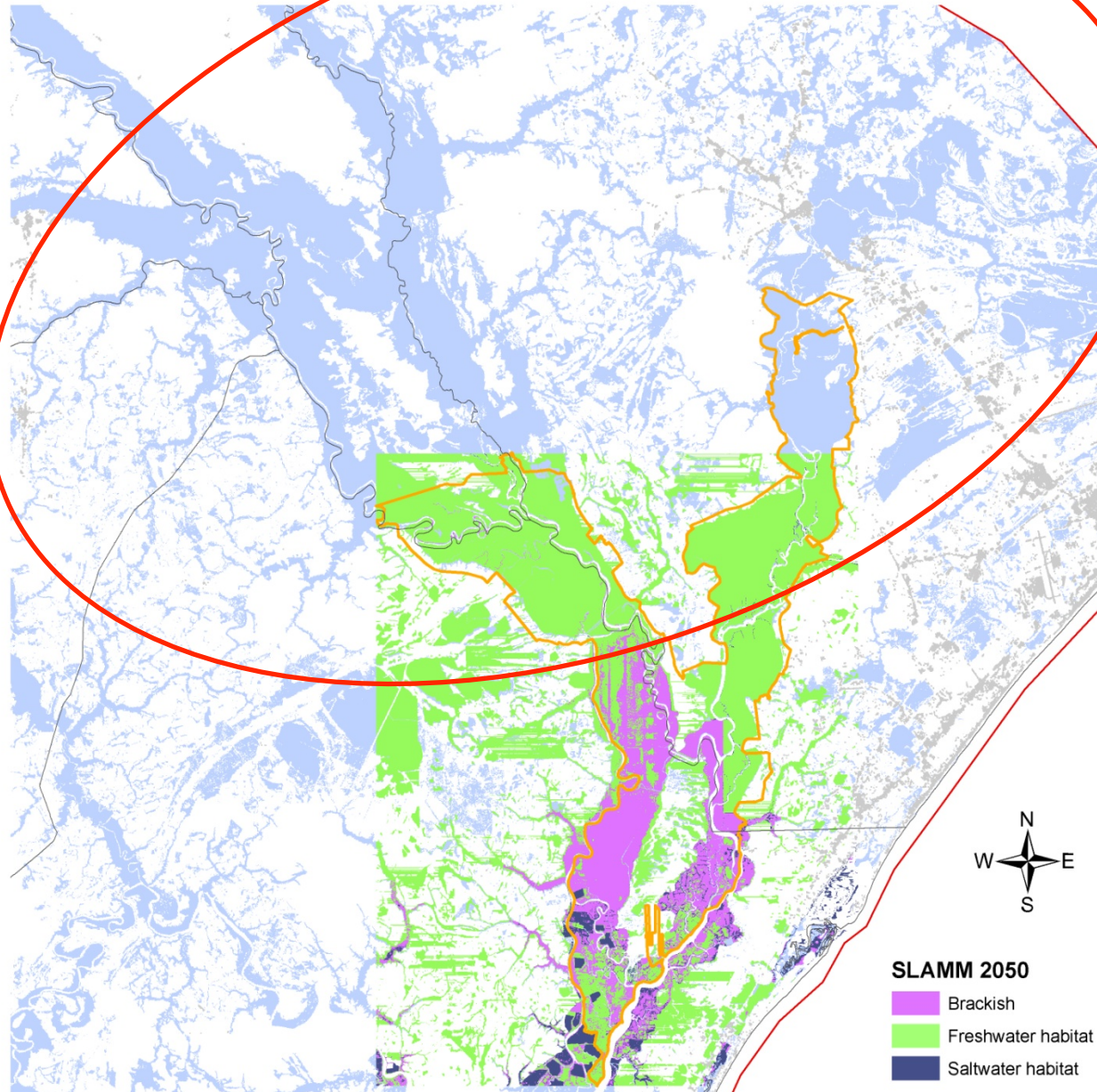
- Brackish Marsh
- Freshwater Habitats
- Saltwater Habitats
- Waccamaw NWR boundary



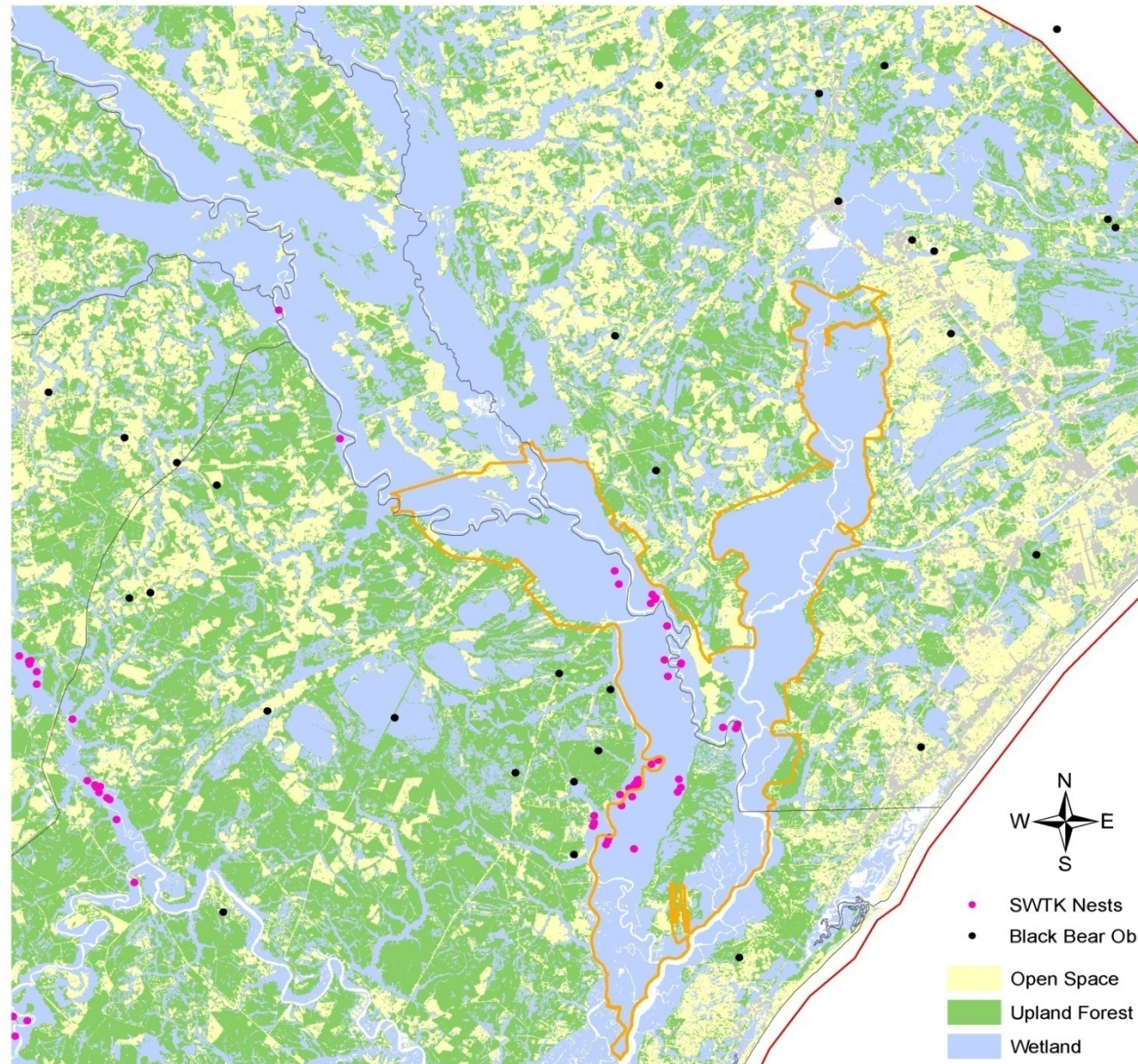
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Using SLAMM Trends

Future freshwater habitats suitable for SWTK may be outside current Waccamaw NWR boundaries



Conservation Criteria



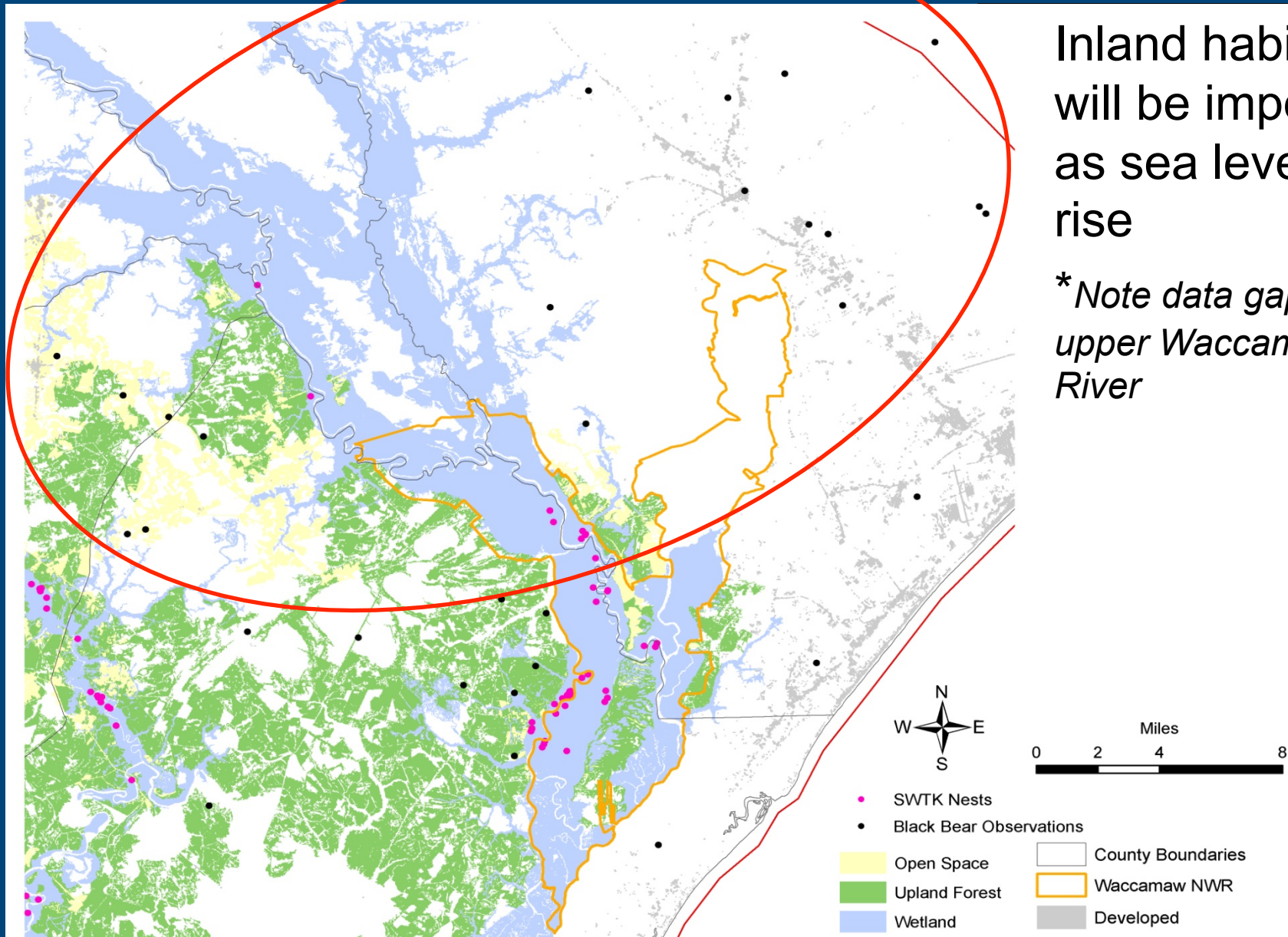
Identify swallow-tailed kite habitat not likely to be impacted by SLR

- Freshwater wetlands
- Close to nest sites

Conservation Criteria

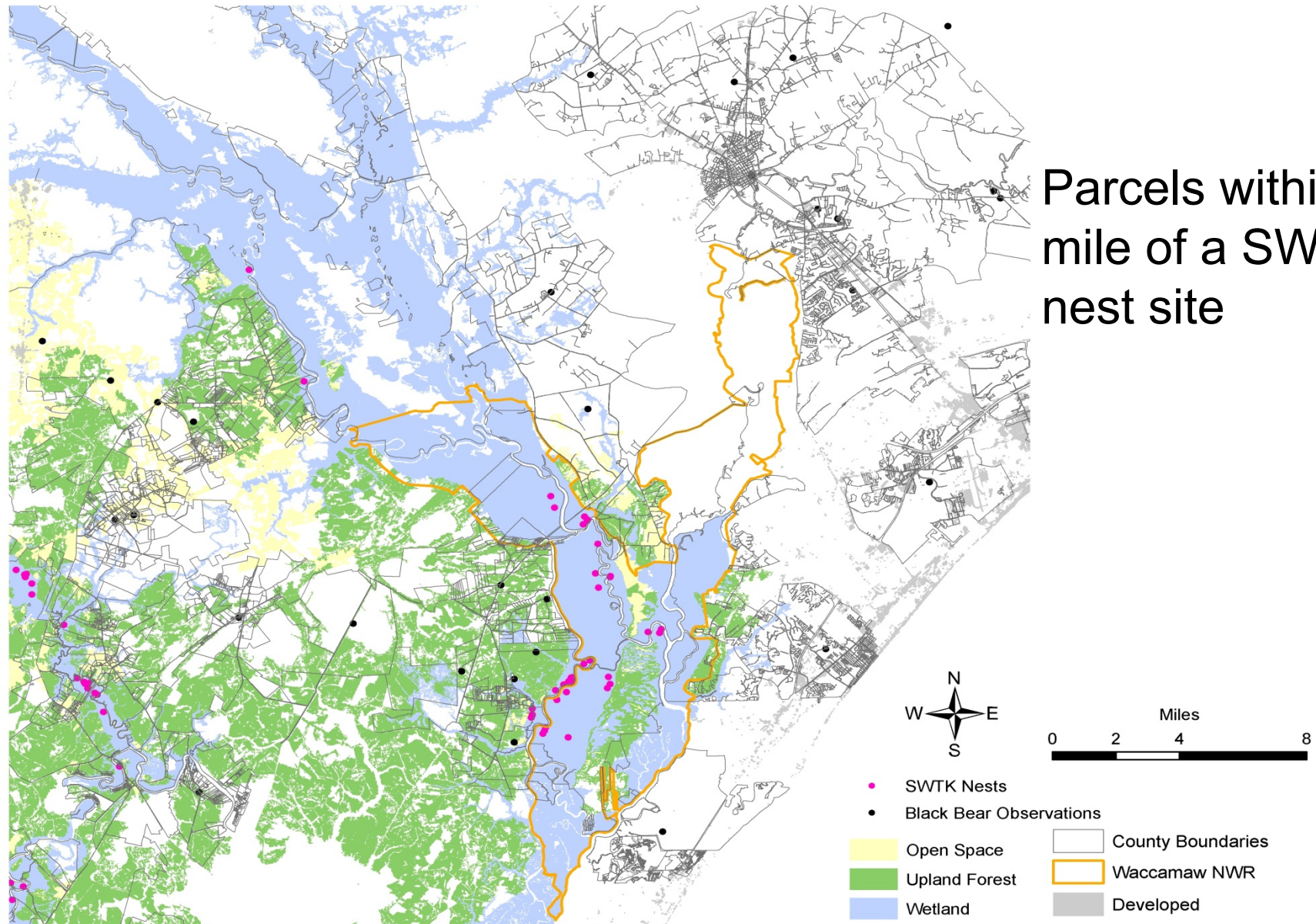
Inland habitats
will be important
as sea levels
rise

**Note data gap in
upper Waccamaw
River*



Parcel Analysis

Parcels within 1 mile of a SWTK nest site



What's Next?

- Fill species monitoring data gaps
- Integrate more black bear data
- Continue parcel analysis
- Compare predicted impacts with actual habitat change
- Consider refuge boundary expansion



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